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Red Pine

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RED PINE

(*Pinus resinosa*)

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Red pine is a medium-sized tree that grows in the northeastern part of the United States and in southeastern Canada. It is classed with the pitch or hard pines, such as longleaf pine and shortleaf pine, and not with the soft pines, such as eastern white pine and western white pine. The stand of red pine in the Lake States has been severely depleted and the stand in the northeastern States is practically gone. Plantations have been established in both regions, but they have not yet reached merchantable size.[1]

The tree grows in close association with eastern white pine, but can be readily distinguished by the conspicuous reddish-brown color of the bark from which red pine takes its name. The two species are frequently cut and sold in mixture as "white pine." The wood of red pine, however, is darker in color and somewhat heavier, harder, and stronger than that of eastern white pine and is more resinous. Red pine lumber is not considered as desirable as eastern white pine lumber for use where a wood light in weight and color, free from resin, and with a uniform texture is needed for the best results, but for many purposes both are employed without distinction, especially for general building construction, planing mill products, and boxes and crating.

Red pine, on account of its close association with eastern white pine of long-established reputation, has had its merits somewhat overshadowed. This applies both to the quality of the wood and to the reforestation possibilities of the tree. As to wood quality, the appreciable proportion of red pine in "white pine" lumber from the Lake States has apparently had little if any influence on its satisfactory use for a wide range of products.

The advantages of red pine for reforestation lie in its commercial value for lumber, its ability to grow on relatively poor soils, its hardiness, and its comparative freedom from injury by insects and fungi. The far-reaching destruction caused by the white-pine blister rust and the white pine weevil to trees of the white pine group, especially to the stands of eastern white pine, and the freedom of red pine from such attack, will undoubtedly be a factor in furthering its use for reforestation.

[1] These plantations probably cover several hundred thousand acres in each region.

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FIGURE 1.—Range of red pine (*Pinus resinosa*) in the United States.

Nomenclature.—Red pine is frequently called Norway pine.[2] Occasionally it is known as hard pine, pig iron pine, pitch pine, and shellbark Norway.

Distribution and growth.—In the United States the range of growth of red pine includes New England, New York, Pennsylvania, and the Lake States (fig. 1).[3] In Canada its range extends westward from Nova Scotia through New Brunswick, southern Quebec, southern Ontario, and into Manitoba. It grows best in the Lake States and Ontario where the climate is cold in winter and rather hot in summer.

The tree is not exacting in its soil requirements and will grow even on nearly dry coarse sand in mixture with jack pine which it may ultimately replace except in very dry locations. It produces better timber, however, on damp, fine sand and here is able to compete successfully with both rivals, eastern white and jack pine, and occasionally to form pure stands. Red pine will also produce excel-

[2] The name Norway pine is unfortunate as the tree is a native American species. It is reported to have formerly been abundant near the town of Norway, Maine, and this may account for the name.

[3] Scattered red pine trees have been found in West Virginia.

lent timber on rich well-drained soils but is seldom found on such soils as it is generally crowded out by eastern white pine and various hardwoods.

Red pine produces seed in abundance only at intervals of 3 to 5 years. The seed is distributed by the wind and must fall on fairly open ground partly free from grass and weeds and exposed to direct sunlight if it is to germinate and grow. Red pine requires more sunlight than eastern white pine for survival, but can get along on less than jack pine. Red pine, however, cannot exist on as poor soils as jack pine and with so little moisture. Mature forest trees grown under favorable conditions are generally about 80 feet in height and 2 to 3 feet in diameter with a straight, round, slightly tapering trunk often free of branches for one-half or two-thirds of its length. Under average conditions the tree adds about 1 foot to its height each year until it reaches an age between 60 and 70 years. After that, height growth is less and practically ceases at an age of about 100 years. Occasional trees reach a height of 120 feet. Diameter growth is more variable. Dominant trees under average conditions generally reach a diameter of 10 inches in 50 years, 17 inches in 100 years, and 27 inches in 200 years. Trees over 280 years old are rare. The largest single red pine tree of which there is a reliable record measured 5 feet in diameter.

Supply.—The stand of red pine, like that of its close associate eastern white pine, has been markedly reduced by heavy cutting in past years, and the remaining supply is now confined almost entirely to the Lake States. The original pine forests of the northeastern States contained some red pine, but the proportion of this species was considerably smaller than in the original stands of the Lake States. The red pine plantations in the northeastern States will in time assume commercial importance as a source of saw timber.

An estimate made in 1914 placed the stand of red pine in the Lake States at 17 billion board feet.[4] The results of a forest survey made in 1938 showed a stand of 1,478,380,000 board feet of red pine of saw timber size,[5] of which 998,380,000 board feet was in Minnesota, 293 million board feet in Wisconsin, and 187 million board feet in Michigan. In the same group of States the survey showed a stand of 3,753,200,000 board feet of Eastern white pine and 2,677,970,000 board feet of jack pine.

Production.—In the statistics of lumber production for the Lake States the term "white pine" includes eastern white pine, red pine, and jack pine. About 35 years ago it was estimated that approximately 30 percent of the "white pine" cut in the Lake States was red pine and that practically all of the remainder was eastern white pine. In recent years the proportion of red pine has been less—probably about 20 percent—and the proportion of jack pine much greater. The average annual cut of "white pine" in the Lake States for the period 1933–42 was approximately 132 million board feet. If the lumber produced from the three species that make up this cut is proportional to their stand, the average annual cut of red pine in recent years would be about 24 million board feet. The average annual cut of red pine

[4] See Woolsey, T. S., Jr., and Chapman, H. H. Norway pine in the Lake States. U. S. Dept. Agr. Bul. 139, 42 pp., illus. 1914.

[5] Includes trees 9 inches and over in diameter breast high. See Cunningham, R. N., and Mason, H. C. Forest areas and timber volumes in the Lake States. Lakes States Forest Expt. Sta. Econ. Note 10, 10 pp. 1938. [Processed.]

lumber during the period 1906–08 is estimated at approximately 600 million board feet or 25 times the cut in recent years.

Properties.—The heartwood of red pine varies in color from a pale red to a reddish brown. The sapwood is nearly white with a yellowish tinge; it is generally from 2 to 4 inches wide in trees of saw-timber size. The wood resembles the lighter weight wood of the southern pines. It is not so dense as typical longleaf pine but denser than eastern white pine. In the annual rings the summerwood shows distinctly as dark bands in contrast to the lighter colored wider springwood. The wood of red pine is moderately heavy,[6] moderately strong when used as a beam or as a post (compression endwise), stiff, moderately soft, and moderately high in shock resistance. It is generally straight-grained, not so uniform in texture as eastern white pine, is somewhat resinous, and has a resinous odor. The green lumber has a moderately large shrinkage when dried but is not difficult to air-dry or kiln-dry without checking or warping and stays in place well when once properly seasoned.

Red pine is rated below eastern white pine in ease of working with tools and about the same as eastern white pine in nail-holding ability. In paint-holding it is rated with southern pine and Douglas-fir in the group of woods which hold paints least satisfactorily. Red pine is not durable when placed under conditions favorable to decay but can be treated satisfactorily with a preservative, although moderately difficult to penetrate.

Red pine can be made into paper pulp by at least two pulping processes.[7] The sulfate process yields a very strong pulp suitable for high-grade kraft wrapping paper or paperboard. The wood can also be pulped by using the sulfite process with slight modifications. Such pulp, however, is liable to be pitchy unless care is taken to use only young trees that are nearly all sapwood.

Principal uses.—Red pine is used principally for lumber and to a less extent for piling, poles, cabin logs, hewed ties, posts, and fuel wood. The lumber is put to many of the same uses as eastern white pine; it goes principally into general building construction; planing mill products such as siding, ceiling, and flooring; sash, doors, blinds, and general millwork; and boxes and crates. Other less important uses for the lumber include car construction, agricultural implements, woodenware and novelties, and tanks. Red pine structural material, including piling, etc., when it is to be used under conditions favorable to decay, is frequently treated with a wood preservative to prolong its life. In recent years the logs have been in considerable demand in the Lake States for cabin construction in resort development.

In early years red pine was in considerable demand for ship construction, especially for masts, spars, and decking. Some use has been made

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[6] The average weight of red pine in a thoroughly air-dry condition (12 percent moisture) is 34 pounds per cubic foot. A similar weight for eastern white pine is 25 pounds.

[7] Six processes are used commercially in making paper pulp from wood. One is the mechanical or ground-wood process, in which the wood is reduced to pulp on a grindstone. The yield approaches 100 percent of the weight of the wood. Four are chemical processes—the sulfite, sulfate, soda, and neutral sulfite. They depend upon the dissolving action of chemical reagents which remove essentially all of the binding material (lignin) surrounding the cellulose fibers and leave them in a fairly pure state. The removal of the lignin is accomplished by cooking the wood chips with the proper chemical under steam pressure. The yield of pulp is about one-half the weight of the wood. In a sixth process, the semichemical, part of the lignin is removed by chemical means, and the resultant pulp, containing some lignin, is further refined by mechanical means. The yield of semichemical pulp is intermediate between the yields obtained with the mechanical process and the chemical processes.

of the stumps of the larger trees cut many years ago for distillation in the production of limited quantities of turpentine and rosin.

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